

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-92. (Cancelled)

93. (New) A method for sending a multidimensional database query to one or more data servers, the multidimensional database query including a grid having one or more rows and one or more columns, an action range, and an operation, the method comprising:

creating a row tree structure, said row tree structure representing title and header rows in the query grid;

creating a column tree structure, said column tree structure representing header columns in the query grid;

performing the operation on the row tree structure and the column tree structure;

splitting the query grid into two or more split query grids using the row tree structure and the column tree structure; and

transmitting the split query grids to the one or more data servers.

94. (New) The method of claim 93, wherein said creating a row tree structure includes assigning members of the same row of the query grid as siblings of each other in the row tree structure.

95. (New) The method of claim 94, wherein said creating a row tree structure further includes assigning members of a row in the query grid as children of members of a previous row in the query grid in the tree structure.

96. (New) The method of claim 95, wherein said assigning members of a row in the query grid as children includes, for each member in a row in the query grid:

determining a distance between a member of a row in the query grid and members of a previous row in the query grid;

assigning said member as a child of a closest member in said previous row; and

wherein if two members in said previous row are equidistant to said member, said closest member is the first of said two members.

97. (New) The method of claim 93, wherein each of one or more nodes in said row tree structure contains row and column information regarding a corresponding cell in the query grid.

98. (New) The method of claim 93, wherein said creating a column tree structure includes assigning members of the same column of the query grid as siblings of each other in the column tree structure.

99. (New) The method of claim 98, wherein said creating a column tree structure further includes assigning members of a column in the query grid as children of members of a previous column in the query grid in the tree structure.

100. (New) The method of claim 99, wherein said assigning members of a column in the query grid as children includes, for each member in a column in the query grid:

determining a distance between a member of a column in the query grid and members of a previous column in the query grid;

assigning said member as a child of a closest member in said previous column; and

wherein if two members in said previous column are equidistant to said member, said closest member is the first of said two members.

101. (New) The method of claim 93, wherein each of one or more nodes in said column tree structure contains row and column information regarding a corresponding cell in the query grid.

102. (New) The method of claim 93, further comprising deleting at least a portion of the information from the query grid that is not row and column information of each node or information about a parent, sibling, or child of each node.

103. (New) The method of claim 102, wherein said at least a portion of the information includes information selected from the group consisting of data cells, alias information, repeated member names, external text, and external labels.

104. (New) The method of claim 102, further comprising modifying the action range in light of said deletion.

105. (New) The method of claim 103, wherein deleted external texts or deleted external labels are saved in a data structure with corresponding row and column information.

106. (New) The method of claim 93, further comprising checking the row and column trees to ensure all basic dimensions of each node in the row and column trees are represented in the trees.

107. (New) The method of claim 106, wherein dimensions may be represented in the trees directly or through an associated attribute dimension.

108. (New) The method of claim 106, further comprising adding any basic dimensions to the trees that are not represented in the trees.

109. (New) The method of claim 93, wherein said performing the operation includes:
traversing said row tree structure in pre-order to determine if any of the nodes is in the action range;

for each node in the action range:

querying related members of the member corresponding to the node using metadata, said querying based on the operation; and

inserting or deleting nodes of said row tree structure based on results of said querying while maintaining correct relationships in the row tree structure.

110. (New) The method of claim 109, wherein said performing the operation further includes:
traversing said column tree structure in pre-order to determine if any of the nodes is in the
action range;

for each node in the action range:

querying related members of the member corresponding to the node using
metadata, said querying based on the operation; and

inserting or deleting nodes of said column tree structure based on results of said
querying while maintaining correct relationships in the column tree structure.

111. (New) The method of claim 93, wherein said splitting the query grid includes splitting
the query grid based upon a user-provided basis for splitting.

112. (New) The method of claim 93, further comprising:

transmitting said split query grids to a data server for data retrieval one at a time.

113. (New) The method of claim 93, further comprising:

transmitting said split query grids to multiple data servers simultaneously for data
retrieval.

114. (New) An apparatus for sending a multidimensional database query to one or more data
servers, the multidimensional database query including a grid having one or more rows and one
or more columns, an action range, and an operation, the apparatus comprising:

means for creating a row tree structure, said row tree structure representing title and header rows in the query grid;

means for creating a column tree structure, said column tree structure representing header columns in the query grid;

means for performing the operation on the row tree structure and the column tree structure;

means for splitting the query grid into two or more split query grids using the row tree structure and the column tree structure; and

means for transmitting the split query grids to the one or more data servers.

115. (New) The apparatus of claim 114, wherein said creating a row tree structure includes assigning members of the same row of the query grid as siblings of each other in the row tree structure.

116. (New) The apparatus of claim 115, wherein said creating a row tree structure further includes assigning members of a row in the query grid as children of members of a previous row in the query grid in the tree structure.

117. (New) The apparatus of claim 116, wherein said assigning members of a row in the query grid as children includes, for each member in a row in the query grid:

determining a distance between a member of a row in the query grid and members of a previous row in the query grid;

assigning said member as a child of a closest member in said previous row; and

wherein if two members in said previous row are equidistant to said member, said closest member is the first of said two members.

118. (New) The apparatus of claim 114, wherein each of one or more nodes in said row tree structure contains row and column information regarding a corresponding cell in the query grid.

119. (New) The apparatus of claim 114, wherein said creating a column tree structure includes assigning members of the same column of the query grid as siblings of each other in the column tree structure.

120. (New) The apparatus of claim 119, wherein said creating a column tree structure further includes assigning members of a column in the query grid as children of members of a previous column in the query grid in the tree structure.

121. (New) The apparatus of claim 120, wherein said assigning members of a column in the query grid as children includes, for each member in a column in the query grid:

determining a distance between a member of a column in the query grid and members of a previous column in the query grid;

assigning said member as a child of a closest member in said previous column; and

wherein if two members in said previous column are equidistant to said member, said closest member is the first of said two members.

122. (New) The apparatus of claim 114, wherein each of one or more nodes in said column tree structure contains row and column information regarding a corresponding cell in the query grid.

123. (New) The apparatus of claim 114, further comprising deleting at least a portion of the information from the query grid that is not row and column information of each node or information about a parent, sibling, or child of each node.

124. (New) The apparatus of claim 123, wherein said at least a portion of the information includes information selected from the group consisting of data cells, alias information, repeated member names, external text, and external labels.

125. (New) The apparatus of claim 123, further comprising modifying the action range in light of said deletion.

126. (New) The apparatus of claim 124, wherein deleted external texts or deleted external labels are saved in a data structure with corresponding row and column information.

127. (New) The apparatus of claim 114, further comprising checking the row and column trees to ensure all basic dimensions of each node in the row and column trees are represented in the trees.

128. (New) The apparatus of claim 127, wherein dimensions may be represented in the trees directly or through an associated attribute dimension.

129. (New) The apparatus of claim 127, further comprising adding any basic dimensions to the trees that are not represented in the trees.

130. (New) The apparatus of claim 114, wherein said performing the operation includes:
traversing said row tree structure in pre-order to determine if any of the nodes is in the action range;

for each node in the action range:

querying related members of the member corresponding to the node using metadata, said querying based on the operation; and

inserting or deleting nodes of said row tree structure based on results of said querying while maintaining correct relationships in the row tree structure.

131. (New) The apparatus of claim 130, wherein said performing the operation further includes: traversing said column tree structure in pre-order to determine if any of the nodes is in the action range;

for each node in the action range:

querying related members of the member corresponding to the node using metadata, said querying based on the operation; and

inserting or deleting nodes of said column tree structure based on results of said querying while maintaining correct relationships in the column tree structure.

132. (New) The apparatus of claim 114, wherein said splitting the query grid includes splitting the query grid based upon a user-provided basis for splitting.

133. (New) The apparatus of claim 114, further comprising:

means for transmitting said split query grids to a data server for data retrieval one at a time.

134. (New) The apparatus of claim 114, further comprising:

means for transmitting said split query grids to multiple data servers simultaneously for data retrieval.